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Activation of biosynthesis of guanyl-specific ribonuclease secreted by Bacillus circulans under salt stress

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Abstract

The gene transcription of guanyl-specific ribonucleases (RNases), which provide available phosphate to cells of Bacillus, is controlled by the signal transduction system PhoP-PhoR. However, the biosynthesis of B. circulans RNase does not depend on the signal-transduction regulatory proteins of Pho regulon. It has been found that raising the salt molar concentration in culture medium increases the level of extracellular guanyl-specific ribonuclease Bci synthesized by B. circulans. Sequences homologous to the binding sites of the regulatory protein DegU were found in RNase Bci promoter. The functioning of the DegS-DegU signal transduction system is stimulated by a high salt concentration. Using a strain of B. subtilis that is defective in the DegU regulatory protein, we have shown that the DegS-DegU system participates in the regulation of RNase Bci expression under salt stress.

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Keywords

Bacillus circulans, biosynthesis activation, guanyl-specific ribonuclease, salt stress